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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,724	02/09/2004	Afshin Momtaz	BU3393	9221

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EXAMINER	
MALKOWSKI, KENNETH J	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,724	MOMTAZ ET AL.	
	Examiner	Art Unit	
	Kenneth J. Malkowski	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 5-8, 11-12, 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0151268 to Hidaka et al. in view of U.S. Patent No. 6,144,697 to Gelfand et al.

With respect to claims 1, 7 and 14-15, Hidaka discloses an optical communication device comprising (complete with transmitter 12, communication media 16, and receiver 14, Figure 1): a continuous time filter (page 3 paragraph 24 (continuous time analog filter))(32, Figure 2)(42, Figure 3) having an adjustable bandwidth, wherein the continuous time filter reduces channel induced distortion in an incoming data signal (page 2 paragraph 24 (adjustable filter 32 compensates for distortion in the signal wherein control and adjustment of adjustable filter is provided by adaptation control 39)), wherein the continuous time filter generates a filtered incoming data signal (page 2 paragraph 28 (adjustable filter receives transmitted data sequence ak after the signal has traveled over channel 42)); for reducing inter-symbol interference in the filtered incoming data signal (page 2 paragraph 22 (adaptive equalization system provides high-degree equalization to overcome ISI in the data signal communicated)). However, Hidaka fails to specifically disclose a decision feedback equalizer. Gelfand,

from the same field of endeavor discloses equalization techniques to reduce intersymbol interference (title) wherein decision feedback equalization is implemented (page 2 lines 21-33 (decision symbol based feedback is used to reduce intersymbol interference (hereinafter ISI))). Therefore, it would have been obvious to one of ordinary skill in the art to implement the decision feedback equalizer as disclosed by Gelfand into the receiver system as disclosed by Hidaka. The motivation for doing so would have been to remove ISI for prior to further equalization as well as to reduce the amount of expensive multiplication units needed for proper equalization (column 2 lines 25-33).

With respect to claims 2, 8 and 17 Hidaka in view of Gelfand disclose the communication device of claim 1 further comprising a bandwidth controller (Hidaka: page 2 paragraph 24 (control and adjustment of adjustable filter 32 is provided by adaptation control 39))(Hidaka: 39, Figure 2) that estimates bandwidth error of the continuous time filter (Hidaka: 38, Figure 2 (error calculator)) and generates a control signal to adjust the bandwidth of the continuous time filter to reduce the bandwidth error (Hidaka: page 2 paragraph 28 (adjustable filter receives a control signal for adjustment of filter coefficients))(Hidaka: page 3 paragraph 32 (calculation of error ei is used to adjust subsequent signals passing through adjustable filter 44 to compensate for distortion)).

With respect to claims 5, 11 and 19 Hidaka in view of Gelfand disclose the communication device of claim 2, wherein the decision feedback equalizer comprises a summer (Gelfand: 64, Figure 2) that generates a combined signals by combining an equalized feedback signal (Gelfand: 89, Figure 2) with the filtered incoming data signal

(Gelfand: 79, Figure 2) to reduce the inter-symbol interference in the filtered incoming data signal (Gelfand: (page 2 lines 21-33 (decision symbol based feedback is used to reduce ISI)).

With respect to claims 6, 12 and 20, Hidaka in view of Gelfand disclose the communication device of claim 5 wherein the bandwidth controller comprises: an analog to digital converter (component boxes 133 an 135 in Figure 4 can be a combination of digital and analog circuits or a combination of digital and analog circuits. Furthermore, it is inherent that the analog output from the adjustable filter needs to be converted from the analog to the digital before entering processor 138), coupled to the summer ((Gelfand: 64, Figure 2), wherein the combination of Hidaka and Gelfand places the analog-digital circuitry after the insertion of the summer of Gelfand, for instance in Figure 4 of Hidaka where signal is split prior to detector 134) that digitizes the combined signal; and a combiner that subtracts the digitized combined signal from the binary signal to generate a bandwidth error signal (Hidaka: 70, Figure 5)(Hidaka: page 4 paragraph 44 (at summation node 70 sampled signal is subtracted from expected sample signal to produce an error)). However Hidaka in view of Gelfand fail to disclose a digital limiter, coupled to receive the digitized combined signal from the analog to digital converter. Despite this, digital limiters are notoriously well known in the art in signal processing circuits and are commonly used in such circuits. Therefore, it would have been obvious to one of ordinary skill in the art to place a digital limiter in the processing circuitry disclosed by Hidaka in view of Gelfand. The motivation for doing so would have been to create a smoother processing signal.

3. Claims 3, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0151268 to Hidaka et al. in view of U.S. Patent No. 6,144,697 to Gelfand et al. and further in view of U.S. Patent No. 5,179,302 to Wagner et al.

With respect to claims 3, 9 and 16 Hidaka discloses the communication device of claim 1, however fails to specifically disclose the continuous time filter comprises at least one cascaded low pass filter. However, adjustable filters comprising at least one cascaded low pass filter is are known in the art and cannot be considered a patentable limitation. Wagner, from the same field of endeavor discloses a tunable filter (title, tunable data filter) wherein the filter includes cascaded filters wherein the cascaded filter comprises at least one low pass filter (page 2 lines 64-67 (notch filter and low-pass filter are cascaded serially)). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the cascaded low-pass filter as taught by Wagner into the adjustable filter arrangement as taught by Hidaka. The motivation for doing so would have been to reduce bit error rate and noise bandwidth (column 5 lines 53-58). Furthermore, it is known that cascading arrangements approximate which make up higher order transfer functions possess a greater degree of signal quality than a single filter with the same higher order transfer function characteristics.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0151268 to Hidaka et al. in view of U.S. Patent No. 6,144,697 to Gelfand et al. and further in view of U.S. Patent No. 5,179,302 to Wagner et al. and further in view of U.S. Patent No. 6,968,167 to Wu et al.

With respect to claims 4,10 and 18 Hidaka in view of Gelfand and further in view of Wagner disclose the communication device of claim 3 wherein each of the at least one low pass filter (Wagner: 90, Figure 3) comprises adjustable capacitive loads coupled to outputs of the differential pair of transistors for adjusting the bandwidth of the low pass filter (Wagner: capacitor 42C is used to tune low pass filter 90)(Wagner: columns 3 lines 1-13 (voltage tunable capacitors coupled to the low-pass filter)). However, Hidaka in view of Wagner fail to specifically disclose a differential of transistors for used for adjusting bandwidth. Despite this differential transistor pairs used for bandwidth alteration is well known in the art. Wu, from the same field of endeavor discloses a differential transistor pair arrangement (Figure 4 (a)) substantially similar to the one as disclosed by applicant in applicants specification, Figure 6. Wu teaches calibration of the capacitors (column 43 lines 4-14) and the filter arrangement with a control word (column 18 lines 1-3 and 17-30)(Figure 12a)(column 43 lines 37-46). Wu further teaches an RC low-pass filter (column 44 line 27) can be controlled using a parallel capacitor array ((column 44 lines 52-56). Therefore, it would have been obvious to one of ordinary skill in the art to implement the differential pair of transistors with capacitance control as disclosed by Wu. The motivation for doing so would have been to achieve greater adaptivity (column 18 lines 1-2) and also to provide frequency planning, agility, and noise immunity (column 13 lines 35-40).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0151268 to Hidaka et al. in view of U.S. Patent

No. 6,144,697 to Gelfand et al. and further in view of U.S. Patent Application Publication No. 2005/0019042 to Kaneda et al.

With respect to claim 13, Hidaka in view of Gelfand the communication system of claim 7, however does not describe specifics of optical communication. Kaneda, from the same field of endeavor discloses a receiver (Figure 4) further comprising an optical detector for converting the received information signal to an electrical signal (page 1 paragraph 4 (optical receiver includes a photo-detector for converting a received optical signal to an electrical signal)). Therefore, it would have been obvious to one of ordinary skill in the art to implement the optical communication elements as disclosed by Kaneda into the transmission system as disclosed by Hidaka in view of Gelfand. The motivation for doing so would have been to keep pace with increasing bandwidth demands (Kaneda: page 1 paragraph 2).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to increasing signal quality in photonic networks in general:

U.S. Patent Application Publication No. 2005/0123036 is cited to show bandwidth control using dfe and filter bandwidth alteration

U.S. Patent Application Publication No. 2004/0044713 is cited to show adaptive filter coefficient determination

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Malkowski whose telephone number is (571) 272-5505. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KJM 10/20/06

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER